Translation

PCT/FR2003/000884

PATENT COOPERATION TREATY

PCT

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference 8264	FOR FURTHER ACTION See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)	
International application No. PCT/FR2003/000884	International filing date (*day/month/year*) 20 mars 2003 (20.03.2003)	Priority date (*day/month/year*) 29 mars 2002 (29.03.2002)
International Patent Classification (IPC) or national classification and IPC G10L 15/28, 15/14, 15/18		
Applicant FRANCE TELECOM SA		

1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.

2. This REPORT consists of a total of 5 sheets, including this cover sheet.

☒ This report is also accompanied by ANNEXES, i.e., sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).

These annexes consist of a total of 1 sheets.

3. This report contains indications relating to the following items:

- I ☒ Basis of the report
- II ☐ Priority
- III ☐ Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- IV ☐ Lack of unity of invention
- V ☒ Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- VI ☐ Certain documents cited
- VII ☐ Certain defects in the international application
- VIII ☐ Certain observations on the international application

Date of submission of the demand	Date of completion of this report
04 octobre 2003 (04.10.2003)	23 March 2004 (23.03.2004)
Name and mailing address of the IPEA/EP Facsimile No.	Authorized officer Telephone No.

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No.
PCT/FR2003/000884

I. Basis of the report

1. With regard to the **elements** of the international application:*

☐ the international application as originally filed

☒ the description:

pages 1-16, as originally filed

pages _____, filed with the demand

pages _____, filed with the letter of _____

☒ the claims:

pages 5-8, as originally filed

pages _____, as amended (together with any statement under Article 19

pages _____, filed with the demand

pages 1-4, filed with the letter of 23 February 2004 (23.02.2004)

☒ the drawings:

pages 1/4-4/4, as originally filed

pages _____, filed with the demand

pages _____, filed with the letter of _____

☐ the sequence listing part of the description:

pages _____, as originally filed

pages _____, filed with the demand

pages _____, filed with the letter of _____

2. With regard to the **language**, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.
These elements were available or furnished to this Authority in the following language _____ which is:

☐ the language of a translation furnished for the purposes of international search (under Rule 23.1(b)).

☐ the language of publication of the international application (under Rule 48.3(b)).

☐ the language of the translation furnished for the purposes of international preliminary examination (under Rule 55.2 and/or 55.3).

3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

☐ contained in the international application in written form.

☐ filed together with the international application in computer readable form.

☐ furnished subsequently to this Authority in written form.

☐ furnished subsequently to this Authority in computer readable form.

☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.

☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. ☐ The amendments have resulted in the cancellation of:

☐ the description, pages _____

☐ the claims, Nos. _____

☐ the drawings, sheets/fig _____

5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).**

* *Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report since they do not contain amendments (Rule 70.16 and 70.17).*

** *Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.*

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No.
PCT/FR 03/00884

V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Claims	1-8	YES
	Claims		NO
Inventive step (IS)	Claims	1-8	YES
	Claims		NO
Industrial applicability (IA)	Claims	1-8	YES
	Claims		NO

2. Citations and explanations

V.1 Reference is made to the following documents:

D1: EP-A-0 715 298 (IBM) 5 June 1996 (1996-06-05)

D2: RAMANUJAM J ET AL: "Address code and arithmetic optimizations for embedded systems" DESIGN AUTOMATION CONFERENCE, 2002. PROCEEDINGS OF ASP-DAC 2002. 7TH ASIA AND SOUTH PACIFIC AND THE 15TH INTERNATIONAL CONFERENCE ON VLSI DESIGN, 7-11 January 2002, pages 619-624, XP010588166 BANGALORE, INDIA, LOS ALAMITOS, CA, USA, IEEE COMPUT. SOC, US ISBN: 0-7695-1441-3

D3: SCHUSTER M: "Memory-efficient LVCR search using a one-pass stack decoder" Computer Speech and Language (2000) volume 14, pages 47-77 XP4418742

V.2 D1 is considered to be the prior art closest to the subject matter of claims 1, 7 and 8. The document in question discloses the following features (see D1, abstract, page 2, lines 25-39, figure 6-7):

a system for transcribing a speech signal, including a step of decoding input data, during which words of which said data is representative are identified by means of a first acoustic model based on phonemes,

phonemes, and after which various possible combinations of said phonemes are generated by reference to a second language model based on words. This method includes a sub-step of storing a plurality of possible combinations of said phonemes, the most probable combination being used to form the lexical output sequence.

Therefore, the subject matter of claims 1, 7 and 8 differs from said system known from D1 in that the phoneme combinations are generated as these phonemes are identified, and that the storage zones for said combinations are addressed by a scalar function applied to parameters specific to the phonemes and combinations thereof.

Storage of the combinations as they are generated after their probability has been verified using a language model makes it possible to restrict the number of combinations actually stored. According to the description given in D3 (Section 1.4.2 Stack decoders), using the language model to verify each word potentially recognised according to its history has the same advantages as those mentioned in the present application. Therefore, it is a routine step for a person skilled in the art to include this feature in the system described in D1 in order to solve the stated problem.

The method used in the present application for optimising memory management in order to accelerate access thereto is also known. Indeed, an addressing method based on a scalar function applied to parameters specific to the objects to be stored (including size, and possible pattern repetitions)

is found in D2. A person skilled in the art wishing to improve the memory access system proposed in D1 would logically be led to use a similar method to the method proposed in D2. However, applying this method to data specific to speech recognition (acoustic models and language models) requires an adaptation of this method that is not trivial, and therefore involves an inventive step.

It is therefore considered that the subject matter of claims 1, 7 and 8 is inventive and meets the requirements of PCT Article 33(3).

V.3 Claims 2-6 are dependent on claim 1, and as such also meet the PCT requirements of novelty and inventive step.